



United States Department of Agriculture
Marketing and Regulatory Programs
Agricultural Marketing Service
Livestock and Seed Program

MGC Instruction 613
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Meat Grading & Certification Branch

EXAMINATION AND SAMPLING PROCEDURES FOR MICROBIOLOGICAL REQUIREMENTS FOR FEDERAL PURCHASE PRODUCTS

Purpose

This Instruction sets forth U.S. Department of Agriculture (USDA), Agricultural Marketing Service (AMS), Meat Grading and Certification (MGC) Branch policies and procedures for the selection, collection, preparation, and shipment of samples of product requiring microbiological analysis for federal purchase products.

Policy

It is USDA policy to analyze meat products for the presence of microbiological organisms when specified by the contract, specification and/or purchaser. This Instruction applies to all meat products requiring AMS microbiological analysis for the National School Lunch Program for which the sampling, preparation, shipment, and analysis has been specified in USDA Technical Requirements Schedules and the contractor's approved technical proposal.

For products requiring microbiological sampling, it is the policy of the MGC Branch to select samples in accordance with universally recognized protocols, maintain sample integrity, and ensure that samples are prepared for laboratory analysis in accordance with the Association of Official Analytical Chemists (AOAC) International (Exhibit A), the Food and Drug Administration Microbiological Analytical Manual (BAM), and the appropriate chapter of the Compendium of Methods for the Microbiological Examination of Foods (current edition) published by the American Public Health Association. *E. coli* O157:H7 samples will be tested using the referenced test method within the USDA/FSIS Microbiology Laboratory Guidebook, 3rd Edition/1998, Chapter 5.

Scope

This Instruction applies to any contractor or subcontractor who supplies meat products as a contractor or subcontractor for federal purchase contracts requiring laboratory analysis certified by the MGC Branch, but **has not specified** sampling procedures in contracts, specifications, schedules, technical proposals, laboratory protocols, etc.

Responsibilities

Contractors Will:

1. Provide a plant employee trained and experienced in microbiological sampling, knowledgeable of the documents referenced in the Policy section of this Instruction, and capable of preparing microbial samples under the supervision of MGC Branch personnel.
2. Provide a Food Safety and Inspection Service (FSIS)-approved sanitary work area and sampling equipment, including a sanitized table, knives, spatulas, and other sample collecting devices.
3. Provide an FSIS-approved water sterilizer capable of maintaining water at a temperature of 180° Fahrenheit (F) (82.2° Celsius (C)) within easy access of the sample preparation facilities and equipment.

Note: Knives, spatulas, etc. shall not be sterilized with chemical sanitizers. Chemical sanitizers may be used to sanitize work spaces and table tops provided the area rests for a minimum of one hour prior to sample collection.

4. Provide self-closing, sterile plastic bags that are suitable for collection of microbial samples.
5. Provide polyfoam mailing containers and refrigerant packs or dry ice for shipment of samples to the designated laboratory in the Lab Testing attachment of MGC Instruction 625, Monitoring and Verification Guidelines of Federal Ground Beef Purchases.
6. Provide a freezing facility capable of rapidly freezing samples to 0° F (-17.8° C) or lower within 24 hours. **Liquid nitrogen or other quick freeze processes are not acceptable.**
7. Pay for all shipment and analysis charges for samples forwarded to the designated laboratory.
8. Select and analyze internal control samples.

MGC Branch Supervisors and Meat Graders at the Point of Production Will:

1. Ensure contractors comply with all microbiological sampling requirements of applicable MGC Branch Instructions and other contractual requirements.
2. Approve the work area, sample collecting equipment, and related supplies.
3. Ensure that only sanitized equipment and supplies are used for sample withdrawal and preparation.
4. Maintain adequate sample control measures at all times to prevent tampering.

MGC Branch Office Will:

1. Monitor movement of samples submitted to the designated laboratory.
2. Ensure analysis results are submitted to shipping personnel in a timely manner.
3. Manage and maintain Laboratory Analysis Files.

Designated Laboratory

The designated laboratory will analyze one-pound samples for the microbial organisms specified which may include, Standard Plate Count, Total Coliforms, E. coli, E. coli 0157:H7, Salmonella, and Coagulase Positive Staphylococci.

Samples

The designated laboratory requires that the Original one-pound micro sample, and if specified the Original one-pound E. coli 0157:H7 sample, and each of the one-pound Reserve samples be split into one-half pound samples and flattened into bricks $\frac{3}{4}$ inch to 1 inch thick. If specified, a total of eleven one-half pound samples (two Original one-half pound Micro samples, two original one-half pound E. coli 0157:H7 samples, four one-half pound Reserve samples (micro and E. Coli O157:H7) and 3 one-half pound Temperature samples) will be collected during each production day.

Sample Selection, Collection and Preparation

Composite samples may be obtained from any randomly selected 4 boxes during the production day. Samples shall be selected and prepared as follows:

1. For bulk ground product – Samples shall be taken from the primary container (box, chub, loaf, etc.). For chubs and loaves, use a sterile knife to remove the outer packaging. Cut the ends of the chub or loaf wrapping off and expose the product by cutting the plastic film from one end to the other, taking sufficient care to avoid contaminating the meat product. Using a sterilized spatula or knife (do not use the same knife used to cut the plastic wrapping), split the chub or loaf lengthwise. Remove the required amount of ground product by making a perpendicular cut to the length of the chub or loaf with a knife, spatula or sterile glove covered hand taking enough product to equal the one pound original and reserve samples. Place samples directly into a sterile sample container, composite, and select and flatten the final sample into bricks $\frac{3}{4}$ inch to 1 inch thick.
2. For patty product – In an individual quick freeze process, patties must be selected before freezing. Six patties shall represent a one-pound sample. Place samples directly into the sterile sample containers, composite, and select and flatten the final samples into bricks $\frac{3}{4}$ inch to 1 inch thick.

3. **Note:** Select an adjacent loaf, bag, chub, or patty if the primary selected sample is inadvertently contaminated during the withdrawal, compositing, and preparation process.

After selecting the final sample from the composite, immediately place the Original, E. coli O157:H7, Reserve, and Temperature samples into a freezer capable of rapidly reducing the temperature to 0° F (-17.8° C) within 24 hours. Dry ice may be used, as long as the sample is wrapped with multiple layers of paper (towels or butcher paper) to **prevent the dry ice from directly touching the product. Liquid nitrogen or other quick freeze processes are not acceptable.**

Sample Shipment

1. Conduct a temperature examination on one of the temperature samples to ensure that the samples have reached 0° F.
2. Prepare the Micro Lab worksheet of the Federal Purchase Laboratory Sampling Form for Meat Products (MGC-110FP). See Exhibit B.
3. Ensure that the telephone and facsimile (fax) numbers and the electronic mail (e-mail) address of the MGC Branch Office are included on the "Send Lab Results To" section of the MGC-110FP.
4. E-mail or fax a copy of the completed MGC-110FP to GradingInfo@usda.gov.
5. Phone – (720) 497-2520.
6. Fax – (720) 497-0571.
7. Place a copy of the completed MGC-110FP in the side pouch of the USDA Sample Bag (Exhibit C) and close.
8. If specified, place the two Original samples (micro and E. Coli O157:H7) and one Temperature sample into the USDA Sample Bags and secure for shipment (step-by-step instructions are on the bag). If the Original samples were lost or unusable, place the Reserve samples and one Temperature sample into the shipping container.
9. Wrap the USDA Sample Bags with a paper buffer, place the USDA Sample Bags into the polyfoam mailer, place frozen refrigerant packs or dry ice around each sample and fill in the open space with dry ice and paper products to ensure that the sample maintains temperature throughout shipment.
10. Securely close the mailer and ship to the designated laboratory.

Do not use tape to close the mailer or apply a shield stamp to the mailer.

Note: Notify the designated laboratory if samples are going to be mailed on Friday (for receipt by the Laboratory on Saturday), so that they may schedule their staff accordingly. This should be done on a plant by plant basis.

Sample Receipt

1. The laboratory will receive one-pound samples on Monday through Saturday, except on select Federal Holidays (New Years Day, July 4th, Labor Day, Thanksgiving and Christmas).
2. If samples are not suitable for testing, the laboratory will contact the MGC Branch Office immediately by phone or e-mail, and will send a follow-up notification by fax.
 - a. Phone – (720) 497-2520.
 - b. E-mail – GradingInfo@usda.gov.
 - c. Fax – (720) 497-0571.
3. A designated MGC Branch staff member will then contact the appropriate grader and request that the Reserve sample(s) be submitted to the designated laboratory for analysis.

Reporting Results

1. The designated laboratory will transmit test results electronically to the designated MGC Branch Office by 5:00 PM EST, Monday through Friday.
2. Test results completed during a weekend will be transmitted no later than 9:00 AM EST of the following Monday or first official business day of the week.
3. In case of network problems, the laboratory will fax the test results to the MGC Branch Office at (720) 497-0571
4. Designated persons will be allowed limited access to the Laboratory Analysis Files.

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EXHIBIT A

39. Meat and Meat Products

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U.S. Department of Agriculture

39.1.01

AOAC Official Method 983.18 Meat and Meat Products Preparation of Sample Procedure

To prevent H₂O loss during preparation and subsequent handling, do not use small samples. Keep ground material in glass or similar containers with air- and H₂O-tight covers. Prepare samples for analysis as follows:

(a) *Fresh meats, dried meats, cured meats, smoked meats, etc.*-Separate as completely as possible from any bone; pass rapidly 3 times through food chopper with plate openings $\leq 1/8"$ (3 mm), mixing thoroughly after each grinding; and begin all determinations promptly. If any delay occurs, chill sample to inhibit decomposition.

Alternatively, use a bowl cutter for sample preparation (benchtop model, 1/2 HP; 14 in. bowl, 22 rpm; two 3.5 in. knives, 1725 rpm; Model 84145, Hobart Corp., 711 Pennsylvania Ave, Troy, OH, 45374, or equivalent). Chill all cutter parts before preparation of each sample.

Food Processor-First Action 1990.-Benchtop model, 110/120 V, 60 Hz, 1 hp, 7.5 A, 1725 rpm, fan-cooled motor, 4 qt bowl; Model R4Y, Robot Coupe, USA, Inc., Jackson, MS, or equivalent. (Caution: Do not remove cutter bowl lid or cutter bowl from base until motor has come to full stop. Do not put hand, finger, or any object into bowl while motor is running. Unplug appliance before servicing or cleaning.)

Precut sample, up to 2 lb, to maximum dimension ≤ 2 in., and transfer to bowl for processing. Include any separated liquid. Process 30 s, then wipe down inner side wall and bottom of bowl with spatula (use household plastic or rubber spatula with ca 2 in. by 4 in. straight-edge blade) and transfer gathered material to body of sample. Continue processing another 30 s and wipe down as before. Repeat sequence to give total of 2 min processing and 3 wipe downs.

Take particular care with certain meat types such as ground beef to assure uniform distribution of fat and connective tissue. At each wipe-down interval, reincorporate these into sample by using spatula to remove fat from inside surfaces of bowl and connective tissue from around blades. If sample consolidates as ball above blades, interrupt processing and press sample to bottom of bowl with spatula before continuing.

Reference: JAOAC **72**, 777(1989).

(b) *Canned meats*.-Pass entire contents of can through food chopper, bowl cutter or food processor, as in (a).

(c) *Sausages*.-Remove from casings and pass through food chopper, bowl cutter or food processor, as in (a). Dry portions of samples of (a), (b), and (c) not needed for immediate analysis, either in vacuo $<60^\circ$ or by evaporating on steam bath 2 or 3 times with alcohol. Extract fat from dried product with petroleum ether (bp $<60^\circ$) and let petroleum ether evaporate spontaneously, finally expelling last traces by heating

short time on steam bath. Do not heat sample or separated fat longer than necessary because of tendency to decompose. Reserve fat in cool place for examination as in chapter on oils and fats and complete examination before it becomes rancid.

Reference: JAOAC **66**, 759(1983).

39.1.02

AOAC Official Method 950.46 Moisture in Meat

A. *Drying in Vacuo at 95-100°* --Final Action

Proceed as in **934.01** (see 4.1.03). (Not suitable for high fat products such as pork sausage.)

B. *Air Drying* --First Action --Final Action 1991

(a) With lids removed, dry sample containing ca 2 g dry material 16-18 h at 100-102° in air oven (mechanical convection preferred). Use covered Al dish ≥ 50 mm diameter and ≤ 40 mm deep. Cool in desiccator and weigh. Report loss in weight as moisture.

(b) With lids removed, dry sample containing ca 2 g dry material to constant weight (2-4 h depending on product) in mechanical convection oven or in gravity oven with single shelf at ca 125°. Use covered Al dish ≥ 50 mm diameter and ≤ 40 mm deep. Avoid excessive drying. Cover, cool in desiccator, and weigh. Report loss in weight as moisture. (Dried sample is not satisfactory for subsequent fat determination.)

References: JAOAC **33**, 749(1950); **36**, 279(1953).

39.1.03

AOAC Official Method 985.14 Moisture in Meat and Poultry Products Rapid Microwave Drying Method

First Action 1985
Final Action 1991

A. *Principle*

Moisture is removed (evaporated) from sample by using microwave energy. Weight loss is determined by electronic balance readings before and after drying and is converted to moisture content by microprocessor with digital percent readout.

USDA FEDERAL PURCHASE PRODUCT ONLY

UNITED STATES DEPARTMENT OF AGRICULTURE AGRICULTURE MARKETING SERVICE LIVESTOCK AND SEED DIVISION		DATE SAMPLED		SAMPLE BAG NUMBER					
LABORATORY SAMPLING FORM FOR MEAT PRODUCTS		DATE MAILED		PRODUCTION CERTIFICATE NO.					
		DATE VENDOR NOTIFIED OF RESULTS		SPECIFICATION / NAME OF PRODUCT/COMMODITY CODE					
APPLICANT NUMBER				ANALYSIS REQUESTED ("X" APPLICABLE BOXES)					
APPLICANT		ESTABLISHMENT NO.		FAT					
RECEIVER OR BUYER		USDA FEDERAL PURCHASE PRODUCT BILL COMMODITY PROCUREMENT		MOISTURE					
SIGNATURE OF PERSON SAMPLING PRODUCT		NAME OF PERSON SAMPLING PRODUCT (PRINT)		SALT					
				OTHER (SPECIFY) *SEE COMMENTS					
				ORIGINAL SAMPLE					
				RESERVE SAMPLE					
SEND LABORATORY RESULTS TO : (Name and address) Meat Grading and Certification Office E-mail: GradingInfo@usda.gov Telephone: (720) 497-2531 FAX: (720) 497-0571				SAMPLE 1		MOISTURE			
				SAMPLE 2					
				SAMPLE 3		SALT			
				SAMPLE 4					
				AVERAGE					
CONTRACT NO.		LOT NO.		NO. OF UNITS PRODUCED		NO. OF POUNDS		NO. OF SAMPLES	
								4	
COMMENTS / FINDINGS (RECORD RESULTS HERE FOR ANALYSIS OTHER THAN FAT, MOISTURE, OR SALT)									
* E.COLI H7:O157 _____ STANDARD PLATE COUNT _____ TOTAL COLIFORMS _____ E. COLI _____ SALMONELLA _____ COAGULASE POSITIVE STAPHYLOCOCCI _____									

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WARNING:

BAG AND CONTENTS ARE PROPERTY OF USDA

Unauthorized Use, Removal, or Alteration in any Manner without the Expressed Permission of an Authorized Representative of USDA is a violation of the Agricultural Marketing Act of 1946, as amended and regulations issued thereunder.

The Words "VOID Tampering Detected" Appearing in yellow on the Green Tape may indicate tampering. Do Not Open Bag. Notify MGC at 202-720-1246.



INSTRUCTIONS

1. Indicate Bag Number on Lab Form. Insert in Back Pouch of Bag. Remove strip and seal.
2. Place sample jars into Bag. Place bag print side down on a flat surface. Fold Back Green Tape away from Bag Opening. Remove strip to expose adhesive.
3. Press Green Tape firmly and smooth to close.
4. **AVOID DIRECT CONTACT WITH DRY ICE!**

To Remove Contents - Cut Along Bottom Dotted Line



Do Not Cut Here to Open

Do Not Cut Here to Open

Do Not Cut Here to Open

Do Not Cut Here to Open

Do Not Cut Here to Open

Do Not Cut Here to Open